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THE USE OF REALISTIC MATHEMATICS EDUCATION IN STUDENTS' MAKING SENSE OF DECIMALS: A DESIGN RESEARCH

ABSTRACT

In this study it is aimed to identify how students' interpretation process occur about decimals in 4th grade where Realistic Mathematics Education is used. In the study the basic principles of Realistic Mathematics Education and interpretation processes of the students were analyzed by the activities developed for indication and comparison of decimals in terms of primary school 4th grade mathematics curriculum.

The study is a design research. Study group of the study is composed of 17 4th grade students from a state school in Aydın city centre. In the application process of the study, primarily, pre-clinical interviews were conducted with the students from the study group in order to determine students' pre-informations about decimals. After that, Hypothetical Learning Trajectory, in which there are learning objectives, teaching activities and material planning and learning conjectures was developed in order to prepare teaching activities based on Realistic Mathematics Education. Then, 11 teaching activities were developed based on Hypothetical Learning Trajectory. Pilot scheme was conducted for 6 activities out of 11 prepared ones and data obtained from this application were presented for expert opinion and the final form of the activities prepared. Based on the experts' opinions, it was decided to the application

of the other 5 activities by reorganizing when needed toward the ongoing analyses in the process of teaching experiment. After this stage, research was proceeded with teaching experiment phase in which teaching process was carried out based on the Realistic Mathematics Education. In the teaching experiment phase conjectures of the activities based on Hypothetical Learning Trajectory were tested. After the completion of teaching experiment stage, post clinical interviews were made with all the students from the study group that teaching based on Realistic Mathematics Education was used in order to introduce how students make sense of the topic of decimals based on Realistic Mathematics Education.

As data collection tool "Decimals Clinical Interview Questions" in clinical interviews; student notes, researcher notes and video records in teaching experiment phase were used. In the analysis of the data obtained from the study, content analysis method was used.

When the process of making sense about decimals of primary school 4th grade students, for whom Realistic Mathematics Education was used, is considered, it was found that students can advance from part to whole with measurements that they did by the weighing activities developed in the direction of the basic principles of Realistic Mathematics Education, can read decimals instinctively, can set up a relationship between the part and the whole, can express the notation of decimals based on the notation of mixed fractions, make sense of decimals based on the connection of mixed fractions and can reach the knowledge of decimals towards connection of fractions and decimals.

KEYWORDS

Realistic Mathematics Education, Design Research, Decimals.